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Novel neutron resonance mode in dx2-y2-wave superconductors

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Abstract

We show that a new resonant magnetic excitation at incommensurate momenta, observed recently by inelastic neutron scattering experiments on YBa 2Cu3O6.85 and YBa2Cu 3O6.6, is a spin exciton. Its location in the Brillouin zone and its frequency are determined by the momentum dependence of the particle-hole continuum. We identify several features that distinguish this novel mode from the previous resonance mode observed near Q = (π,π). © 2005 The American Physical Society.

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